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In the case of the apple, the lipoids are attacked and decreased, but later a large amount of lipoid is constructed in the fungus itself. Non-protein nitrogen of the apple is converted into protein nitrogen of the parasite, decrease of the former paralleling increase of the latter; but some nitrogen loss results from complete decomposition of nitrogenous compounds with liberation of ammonia. The lipoid phosphorus and protein phosphorus of the apple are first broken down into soluble form, and then reconstructed into protein phosphorus within the parasite. The sugars decrease rapidly as the disease proceeds. The disaccharides are used much less rapidly and completely than the monosaccharides. The starch content remains unchanged. Acidity decreases, for the malic acid of the apple is decomposed without the formation of any other acids by the organism, and a large amount of alcohol is formed from soluble carbohydrates. The authors claim a fairly complete statement of the chemical differences between sound and black-rot diseased apples.—CHARLES A. SHULL.

**Tropical vegetation.**—In a botanical travelogue, GLEASON[17] has described in a semi-popular way so many phases of vegetation as to make his series of articles an excellent one for visualizing the diversity and luxuriance of tropical forests. Japan with its intensive cultivation of all available land has so little natural vegetation that it becomes insignificant compared with the Philippines. Here the reader is guided through a forest remarkable for luxuriance and rapidity of growth, and made acquainted with many lianas, epiphytes, and strangling figs or "baletes," without losing sight of the stratification of tree growth. Interruptions of the forest growth made by the natives in their attempts at agriculture are seen in the rapid reforestration of the "parangs," or when fire has intervened in the grassy "cogons." Among other matters of botanical interest is the action of volcanoes, like that of Taal, in destroying vegetation and thus furnishing a splendid field for the study of plant reestablishment and succession.

At Java the Botanic Garden of Buitenzorg with its 16,000 species of plants and the less known but not less interesting economic garden were visited. In the latter collections of such different rubber plants as *Ficus*, *Hevea*, *Castilloa*, and *Manihot* growing side by side seem to abound. The mountain garden at Tjibodas was visited also and the beauties and advantages of these collections of tropical plants are pointed out. A similar visit to the garden at Peradeniya and excursions to examine various types of vegetation upon the island of Ceylon complete the tour.—GEO. D. FULLER.

**Potamogeton.**—HAGSTRÖM[18] has published an elaborate monograph on *Potamogeton*, in which the classification is based largely upon anatomical features. The stele presents 6 "stages" of development, differing in the number and arrangement of the bundles; while 5 kinds of endodermis are recognized. An interesting series of facts is recorded in reference to the "adaptation of some leaves for a double life," and also their "adaptation for different levels of water." Another adaptation explained is the "arrangements in stems and leaves for the purpose of resisting the impetus of the waves and the current of water," 6 kinds of stem structure being recognized. All of these anatomical variations are not merely observed, but are arranged in evolutionary sequence. Numerous hybrids are recognized by means of the new characters used, as well as by sterile pollen grains and "deformed stigmata." In general, hybrids are very sterile, but sometimes sterility was found to occur also in "genuine species." The 138 species, 37 of which are described as new, and the 62 recognized hybrids are grouped in 26 sections. When it is remembered that *Potamogeton* has been credited heretofore with approximately 65 species, this increase to 200 species and hybrids indicates that it is a much more complex assemblage of forms than has been supposed. In general, the species and hybrids are described in great detail, not only including the ordinary taxonomic characters, but also their anatomy and "biology." In short, the monograph treats of the taxonomy, morphology, anatomy, and ecology of *Potamogeton*.—J. M. C.

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[17] GLEASON, H. A., Botanical sketches from the Asiatic tropics. I. Japan; II. Philippines; III. Java; IV. Ceylon. Torreya **15**:93–101, 117–133, 139–153, 161–175, 187–202, 233–244. 1915; **16**:1–17, 33–45. 1916.

[18] HAGSTRÖM, J. O., Critical researches on the Potamogetons. Kgl. Svensk. Vetensk. Handl. **55**:no. 5. pp. 281. *figs. 119.* 1916.

**Pennsylvania trees.**—One of the best of the recent tree manuals issued by various states comes from Pennsylvania.[19] It consists of two parts, the first devoted to an elementary discussion of the principles of forestry, the second consisting of an illustrated manual of the trees of the state. Among the topics treated in an interesting manner are the character of forest stands, their natural and artificial reproduction, the form and structure of trees, including a large number of photographic studies of bark, types and structure of twigs, buds, leaves, flowers, and fruit, and the structure of the wood. In the second part the keys and descriptions appear to be adequate and the illustrations decidedly superior to those usually seen. An entire page is devoted to each species, and the drawings include, in addition to the usual leaves and fruit, careful sketches of the flowers, buds, and leaf scars. The term "tree" is so broadly interpreted as to include such woody plants as *Rhus copallina*, *Acer spicatum*, and *Kalmia latifolia*.—GEO. D. FULLER.

**Addisonia.**—The fourth number of this finely illustrated journal contains colored plates and popular descriptions of *Sedum diversifolium*, *S. humifusum*, *Catasetum Scurra*, *Chionodoxa Luciliae gigantea*, *Agave subsimplex*, *Dasystephana Porphyrio*, *Cymophyllus Fraseri*, *Rhus hirta dissecta*, *Opuntia vulgaris*, *Tillandsia sublaxa*, and *Echeveria australis*.—J. M. C.

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[19] ILLICK, J. S., Pennsylvania trees. Pa. Dept. Forestry Bull. 11. pp. 232. *pls. 129. figs. 109.* 1915.